

<b>Applicant:</b>  City of Seattle Department of Construction and Inspections	<b>Page:</b>  1 of 6	<b>Supersedes:</b>  18-2011
<b>Subject:</b>  General Duties And Responsibilities Of Geotechnical Engineers	<b>Publication:</b>	<b>Effective:</b>
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	<b>Type of Rule:</b>  Code Interpretation	
<b>Index:</b>  Building/Grading - Technical	<b>Ordinance Authority:</b>  SMC 3.06.040	
	<b>Approved</b>  Nathan Torgelson, Director, SDCI	<b>Date</b>

**PURPOSE**

The purpose of this rule is to define the Department's requirements for geotechnical engineers who are hired by permit applicants to analyze surface and subsurface conditions on a site.

Whenever development is proposed in a landslide-prone area as defined in the Regulations for Environmentally Critical Areas (Seattle Municipal Code Chapter 25.09) or when the Director determines that additional soils analysis is appropriate on a particular site, the applicant is required to submit a geotechnical report that evaluates the surface and subsurface conditions on the site. The geotechnical engineer hired to perform this work must comply with the duties and responsibilities included in this rule.

**RULE****GENERAL REQUIREMENTS**

A geotechnical engineer who is a licensed Professional Engineer (Civil) in the state of Washington shall prepare the geotechnical report in accordance with generally accepted geotechnical practices and the General Geotechnical Report Guidelines contained in this rule. The geotechnical engineer must have at

least four years of professional experience under the direction of a licensed Professional Engineer (Civil) with demonstrated expertise in geotechnical engineering. The report must be signed and stamped by the geotechnical engineer.

The geotechnical engineer shall attend a pre-construction conference when requested by the Director. The geotechnical engineer is also responsible for developing a program for monitoring the site during construction (to ensure compliance with the recommendations in the geotechnical report and conditions of the permit) and for performing such monitoring.

## **EXPLORATIONS**

The geotechnical engineer shall conduct or direct all subsurface explorations. Explorations conducted in Environmentally Critical Areas shall meet the requirements of Director's Rule 20-90: Regulation and Enforcement of Investigative Field Work Performed in Environmentally Sensitive Areas and Shorelines or subsequent rules.

## **CONTENTS OF GEOTECHNICAL REPORT**

The geotechnical report shall discuss all applicable items listed in the General Geotechnical Report Guidelines contained in this rule. Specific recommendations concerning stability of the site shall be made, if applicable.

The opinions and recommendations contained in the report shall be supported by field observations and testing, e.g. site reconnaissance, appropriate explorations such as borings or test pits, literature review, and laboratory testing of soil characteristics conducted by or under the supervision of the geotechnical engineer in accordance with the American Society of Testing and Materials or other applicable standards.

If required by the Director, evaluation involving significant geologic issues shall be reviewed and approved by a Washington State licensed geologist.

The geotechnical engineer shall submit a statement that in the engineer's judgment all portions of the site and adjacent properties that are disturbed or impacted by the proposed development will be stable or stabilized during construction and will continue to be stable after construction.

## **POTENTIALLY CONTAMINATED SOILS**

In cases where the Director determines or the geotechnical engineer recognizes that a site has been used for manufacturing or industrial purposes or is otherwise potentially contaminated, the geotechnical report shall contain information regarding past treatment, disposal or storage of hazardous materials on the site. Analytical test results of site soils to determine concentration of pollutants shall be presented when required by the Director or when the geotechnical engineer encounters or suspects the presence of ground contamination by hazardous materials. The geotechnical engineer shall provide information concerning the level of contamination, direction of contamination migration, and the approximate extent of the plume. If contamination by hazardous materials is detected, the report shall indicate that the appropriate regulatory agencies have been contacted and provide appropriate discussion concerning reporting obligations of the property owner(s).

## **ADDITIONAL REQUIREMENTS FOR A GEOTECHNICAL REPORT IN LANDSLIDE-PRONE AREAS**

When a report is required for a site located within a landslide-prone area, it shall comply with the following additional submittal requirements.

1. An evaluation of the erosion potential on the site during and after construction shall be submitted. It shall include recommendations for mitigation including retention of vegetation buffers and a revegetation program (see SMC 25.09.320). The geotechnical engineer shall provide a statement identifying buffer areas at the top or toe of a slope based on geotechnical site constraints and the impacts of proposed construction methods on the stability of the slope. SMC 25.09.180C outlines minimum buffers required in steep slope areas.
2. The geotechnical engineer shall submit a statement in the soils report that the geotechnical elements of seismic design have been evaluated in accordance with the criteria and ground motions prescribed by the current version of the Seattle Building Code for new structures or ASCE-31/41 for existing buildings.

Slope stability analyses for landslide prone areas shall be evaluated in accordance with Chapter 18 of the Seattle Building Code.

The plan set for the project shall be reviewed by the geotechnical engineer for consistency with these design criteria.

3. The geotechnical engineer shall make a recommendation as to which portion of the site is the most naturally stable and the preferred location of the structure. The limits of the area of grading activity shall be identified in the recommendations.
4. In general, no excavation will be permitted in landslide-prone areas during the typically wet winter months. When excavation is proposed, including the maintenance of open temporary slopes between November 1 and March 31, technical analysis shall be provided to assure that no environmental harm or safety issues would result. The technical analysis shall be submitted for approval by the Director and shall, at a minimum, consist of plans showing mitigation techniques and a letter from the geotechnical engineer. See Director's Rule 26-2015 [Grading Season Extension] or subsequent rules.

A Plan Review and Minimum Risk Statement as described in the General Geotechnical Report Guidelines contained in this rule shall be included.

Reports prepared for master use permit applications and projects in landslide-prone areas shall address comments received from the public and governmental agencies concerning the geotechnical aspects of the proposed development.

The Director may require supplements or amendments to the report when needed to develop a reasonably comprehensive understanding of the soil conditions on the site.

## **PRE-CONSTRUCTION CONFERENCE**

The geotechnical engineer shall attend a pre-construction conference with the applicant, the lead design professional, the contractor, and SDCI representatives when requested by the Director. The purpose of this conference is to discuss the most difficult, challenging, or important aspects of the construction that may pose particular risks or need special attention. The conference may include discussions of excavation and shoring plans, phasing of work, monitoring requirements, geotechnical recommendations, stability risks, weather considerations, disposal of excavated soils, surface and groundwater conditions, fill materials, erosion control, non-disturbance areas, and other matters the Director deems relevant. The geotechnical engineer shall highlight the most critical geotechnical issues during the pre-construction conference.

## **CONSTRUCTION MONITORING**

The geotechnical engineer shall monitor the site and provide special inspection as required by the Director during the construction phase to ensure compliance with the recommendations of the geotechnical report and the geotechnical aspects of the SDCI-approved plans. The construction monitoring shall meet the general requirements for special inspections as found in Director's Rule 6-2016 or subsequent rules.

Unless otherwise approved by the Director, the specific recommendations contained in the geotechnical report shall be implemented by the owner. When site visits are made, the geotechnical engineer shall provide a daily field report on the progress of the construction. The daily field reports shall be provided to the SDCI Geotechnical Engineering Section on a weekly basis at a minimum or at such timely intervals as shall be specified by the Director. Written reports may be submitted to SDCI via e-mail to: [SDCI\\_geo@seattle.gov](mailto:SDCI_geo@seattle.gov)). Written reports on the progress of the construction with Seattle Department of Transportation (SDOT) as well as SDCI approvals shall be submitted by the geotechnical engineer to both SDOT and SDCI.

***Omissions or deviations from the approved plans and specifications and significant geotechnical construction issues shall be immediately reported to the Geotechnical Section of SDCI at 206-684-8860 or via e-mail to the SDCI geotechnical reviewer. The geotechnical reviewer will discuss the issues with the geotechnical engineer and provide additional SDCI requirements, if necessary. It is not sufficient to notify only the SDCI Building Inspector and/or Site Inspector or to provide notification of significant geotechnical issues only via field report.***

The final construction monitoring report shall contain a statement from the geotechnical engineer that based upon his or her professional opinion, site observations, and testing during the monitoring of the construction, the completed development substantially complies with the recommendations in the geotechnical report, SDCI-approved plans, and all permit requirements. The final report shall be stamped by the geotechnical engineer and emailed to [SDCI\\_geofinal@seattle.gov](mailto:SDCI_geofinal@seattle.gov). Occupancy of the project will not be approved until the final report has been reviewed and accepted by the Director.

## **CHANGE OF GEOTECHNICAL ENGINEER/SPECIAL INSPECTION AGENCY**

If a new geotechnical engineer/special inspection agency is retained by the owner, the owner shall notify the Geotechnical Section of SDCI of the change in writing. The notification shall be accompanied by a letter to the Geotechnical Section of SDCI, signed and sealed by the new geotechnical engineer, expressing his or her agreement or disagreement with the recommendations of the original geotechnical engineer and stating whether existing plans and specifications conform to his or her recommendations. The letter shall also contain any further recommendations, as well as additional exploration, analysis and testing as applicable, should there be additions or exceptions to the original recommendations. Work relating to the further recommendations shall not proceed until the SDCI Geotechnical Section has approved them; in some cases, revised plans may be required. Review and approval of any further recommendations will not be granted during the pre-construction conference. SDCI will mail a revised special inspection authorization letter to the owner and the new special inspector.

## **GENERAL GEOTECHNICAL REPORT GUIDELINES**

The following are general geotechnical report guidelines<sup>1</sup>. These guidelines are not intended to be all-inclusive. Depending on the scope and scale of the project, some of the information below may not be required. It is the responsibility of the geotechnical engineer to address all factors, which in their opinion, are relevant to the site.

<sup>1</sup> Based upon "Geotechnical Report Guidelines," prepared by ASCE Seattle Section Geotechnical Group and City of Seattle DPD, November 2007.

I. PROJECT INFORMATION AND REPORT PURPOSE

- A. Site Address
- B. Vicinity map
- C. DPD Project Number, if known
- D. Purpose (e.g., feasibility, permit application, ECA exemption, final design)

II. SITE AND PROJECT DESCRIPTION

- A. Site plan showing existing and proposed structures and site improvements, property lines, and existing contour lines if available
- B. Surface conditions, including adjacent properties, structures, and rights-of-way
- C. Description of existing and/or proposed sewer drainage facilities (sanitary and stormwater) on or adjacent to site when these facilities affect or are affected by the proposed work
- D. Description of proposed structural and site improvements
- E. Floor and foundation grades
- F. Anticipated excavation depths

III. GEOLOGY AND GEOLOGIC HAZARDS

- A. Review of available literature, geologic maps
- B. Preliminary geologic hazard assessment (e.g. landslide-prone areas, peat settlement prone areas, liquefaction hazard areas)
- C. Landslide history, including review of GeoMap NW or City files and the Seattle Landslide Study

IV. FIELD EXPLORATIONS AND LABORATORY TESTING

- A. Exploration logs
- B. Field and laboratory testing results

V. SUBSURFACE DESCRIPTION

- A. Subsurface conditions
- B. Geologic profile and site development cross-sections
- C. Groundwater evaluation and levels

VI. ANALYSES

- A. Include soil properties, layering, and geometry
- B. Describe assumptions, analysis methods, results and interpretation.

VII. CONCLUSIONS AND RECOMMENDATIONS

- A. Conceptual siting of structures and general recommendations

- B. Earthquake engineering (e.g. Seattle Building Code seismic parameters)
- C. Slope stability assessment including (1) existing conditions, construction phase, and post-construction phase and (2) global and local stability
- D. Foundation support recommendations (e.g. type, allowable bearing pressures, deep foundation capacities, settlement estimates)
- E. Temporary excavation and/or shoring recommendations, impacts on adjacent properties including utilities and ROW
- F. Lateral earth pressure and resistance recommendations
- G. Grading and earthwork including site preparation, compaction requirements, fill specifications, sequencing of earthwork operations, wet weather considerations
- H. Temporary and permanent surface and subsurface drainage requirements, temporary and permanent dewatering, off site effects
- I. Temporary and permanent erosion control as required by the 2016 Seattle Stormwater Code and Manual.
- J. Other recommendations as needed

VII. PLAN REVIEW AND MINIMUM RISK STATEMENTS

- A. In landslide-prone critical areas, the following will be **required** with all permit applications:

A statement that the most recent plans and specifications submitted to SDCI have been reviewed and conform to the recommendations of the analysis and report and, provided that those conditions and recommendations are satisfied during the construction and use, the areas disturbed by construction will be stabilized and remain stable and will not increase the potential for soil movement; and the risk of damage to the proposed development and from the development to adjacent properties from soil instability will be minimal.
- B. In other areas designated by the Director as having high risk potential, the following shall be submitted:

A statement that the most recent plans and specifications submitted to SDCI have been reviewed and conform to the recommendations of the analysis and report, and provided that the conditions and recommendations are satisfied, the construction and development will not increase the potential for soil movement; and the risk of damage to the proposed development and from the development to adjacent properties from soil instability will be minimal.
- C. In liquefaction-prone critical areas, the statement required under section B will be required when the Director determines the risks are still sufficiently high after consideration of any proposed mitigation.